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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Markus Radimirsch

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EXAMINER

CHANG, RICHARD

ART UNIT

PAPER NUMBER

2663

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/937,608	Applicant(s) RADIMIRSCH ET AL.	
	Examiner Richard Chang	Art Unit 2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2002.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-34 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☒ Claim(s) 17-28 is/are allowed.
 6) ☒ Claim(s) 29-34 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☒ The drawing(s) filed on 01 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/26/01, 2/11/02</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Response to Amendment

1. Applicant's arguments and amendments with respect to claims 17-34 have been fully considered but are moot in view of the new ground(s) of rejection.

Claims 1-16 have been cancelled by applicant.

Specification

2. The disclosure is objected to because of the following informalities in the specification:

a) The listing of references in the specification (see page 13) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

b) The specification is making reference to limitations recited in claim 1 (see page 3, line 1) which results in confusion. Appropriate corrections are required for further consideration.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 31-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to Claim 31 and 33, where the format of making reference to limitations recited in another claim results in confusion, then a rejection would be proper under 35 U.S.C. 112, second paragraph.

Regarding to Claim 32 and 34, A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 29-30, 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 6,654,429 ("Li") in view of US patent 5,809,083 ("Wright") and further in view of US patent 5,732,113 ("Schmidl et al.").

Regarding claim 29, Li teaches a method and apparatus for pilot-symbol aided channel estimation in a wireless OFDM digital communication system (See Fig. 1) comprising of

transmitter (100) for preparing a synchronization train for at least one receiver (120) within a transmission system with use of a data stream with guard intervals for compensating for multi-path propagation (See Fig. 1, Col. 12, lines 33-43), the transmitter comprising

a first device selected from the group consisting of a encoder (102 as coding device) and a modulator (104 as modulating device) , and

insertion device (110) for a pilot symbol (synchronization train), which is formed of a pair at least two different symbol sequences, said insertion device (110) being embodied such that an alternating, periodic insertion of the synchronization train into the data stream prepared by said fist device can be performed (See Fig. 1, Col. 3, lines 18-30), and

a memory device (146) operatively connected to said insertion device (for various symbol sequences associated with the receiver (and for their linkage) (See Fig. 3, Col. 4, lines 41-48).

Li teaches substantially all the claimed invention but did not disclose expressly the particular application involving limitations of

“synchronization train, sequences, said insertion device being embodied such that an alternating, periodic insertion of the synchronization train into the data stream prepared which is formed of at least two different symbols by said fist device can be performed”.

Wright teaches a method and apparatus for transmission of periodically-inserted, differentially encoded pilot words (synchronization train, sequences ... which is formed

of at least two different symbols) to permit receivers to synchronize with the transmitter (See Fig. 4, Col 2, lines 52-65).

A person of ordinary skill in the art would have been motivated to employ Wright in Li in order to obtain method and apparatus for pilot-symbol aided channel estimation in a wireless OFDM digital communication system and to take advantage of transmission of periodically-inserted, differentially encoded pilot words to permit receivers to synchronize with the transmitter in claim 29.

The suggestion/motivation to do so would have been to transmit periodically inserted, differentially encoded pilot words to permit receivers to synchronize with the transmitter, as suggested by Wright in Col 2, lines 52-65. At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains to combine Wright with Li to obtain the inventions specified in claim 29.

As discussed above, Li and Wright teach substantially all the claimed invention but did not disclose expressly the particular application involving limitations of

“evaluating symbol sequences to gain their metrics and selecting an index for minimizing the total metrics within the predetermined interval in view of block synchronization”.

Schmidl et al. teach a method and apparatus for an OFDM receiver for receiving and evaluating a block synchronization by evaluating symbol sequences to gain their metrics and selecting an index for minimizing the total metrics within the predetermined interval in view of block synchronization (complex-valued samples of the received

OFDM signal are continuously used to compute a symbol/frame timing metric continuously used to compute a symbol/frame timing metric) (See Col. 9, line 6-17).

A person of ordinary skill in the art would have been motivated to employ Schmidl et al. in Wright and Li in order to obtain a method and apparatus for pilot-symbol aided channel estimation in a wireless OFDM digital communication system and to take advantage of that complex-valued samples of the received OFDM signal are continuously used to compute a symbol/frame timing metric continuously used to compute a symbol/frame timing metric in claim 29.

The suggestion/motivation to do so would have been that complex-valued samples of the received OFDM signal are continuously used to compute a symbol/frame timing metric continuously used to compute a symbol/frame timing metric, as suggested by Schmidl et al. in Col. 9, line 6-17. At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains to combine Schmidl et al. with Wright and Li to obtain the inventions specified in claim 29.

Regarding claim 30, as discussed above, Li and Wright teach substantially all the claimed invention but did not disclose expressly the particular application involving limitations of

“sampling memory for a received data stream, a synchronization evaluation device which is operatively connected to said sampling memory and is suitable for evaluating a synchronization train including at least two different symbol sequences that can be transmitted periodically in alternation with respect to a chronological position

and/or a center frequency error within a predetermined interval, and for controlling corresponding reception units for block synchronization, frequency synchronization and/or channel estimation”.

Schmidl et al. teach a method and apparatus for an OFDM receiver for receiving and evaluating a synchronization train which can be transmitted by a transmitter within a transmission system with use of a data stream with guard intervals to compensate for multi-path propagation comprising

a sampling memory (122) for a received data stream, a computation device (124 as synchronization evaluation device) which is operatively connected to said sampling memory (122) and is suitable for evaluating a synchronization train including at least two different symbol sequences that can be transmitted periodically in alternation with respect to a timing (chronological) position or a (carrier) center frequency error within a predetermined (frame) interval, and for controlling corresponding reception units for frame (block synchronization), frequency synchronization and/or channel estimation (See Fig. 5, Col 8, line 30 - Col 9, line 60).

A person of ordinary skill in the art would have been motivated to employ Schmidl et al. in Wright and Li in order to obtain an OFDM receiver for receiving and evaluating a synchronization train which can be transmitted by a transmitter within a transmission system with use of a data stream with guard intervals to compensate for multi-path propagation and to take advantage of operatively connecting a sampling memory and a computation device for evaluating a synchronization train including at least two different symbol sequences that can be transmitted periodically in alternation

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with respect to a timing position and/or a carrier frequency error within a predetermined frame interval, and for controlling corresponding reception units for frame synchronization, frequency synchronization or channel estimation in claim 30.

The suggestion/motivation to do so would have been to operatively connect a received data stream sampling memory and a computation device suitable for evaluating a synchronization train including at least two different symbol sequences that can be transmitted periodically in alternation with respect to a chronological position or carrier center frequency error within a predetermined frame interval, and for controlling corresponding reception units for frame synchronization, frequency synchronization and/or channel estimation, as suggested by Schmidl et al. in Col 8, line 30 - Col 9, line 60. At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains to combine Schmidl et al. with Wright and Li to obtain the inventions specified in claim 30.

Regarding claims 32 and 34, these claims have limitation that is similar to those of claims 29 and Li further teaches the wireless communication system using (100 the transmitter of claim 29-30 or the receiver of claim 30) and embodied as a radio OFDM communication system (a line-connected communication system, or a hybrid communication system) with antenna (122 radio components, optical waveguide components and/or line-connected components), said communication system including one transmitter (100) and one receiver (120) assigned to subscribers (See Fig. 1 and 2, Col. 3, lines 18-51), with variable transmission and reception modes (See Fig. 5, Col.

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13, lines 3-9), thus it is rejected with the same rationale applied against claims 29-30 above.

Allowable Subject Matter

7. Claims 17-28 are allowed.

Reason for indicating Allowable Subject Matter

8. The following is an examiner's statement of reasons for allowance:

The prior art along or in combination fails to teach or make obvious the limitations that specifically comprises:

“for a block synchronization using total metrics of at least two different symbol sequences used as the synchronization train, and selecting as a beginning of a block, whichever index minimizes the total metrics within the predetermined interval” as recited in the independent claim 17.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Chang whose telephone number is (571) 272-3129. The examiner can normally be reached on Monday - Friday from 8 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



rkc

Richard Chang
Patent Examiner
Art Unit 2663



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SUPERVISORY PATENT EXAMINER